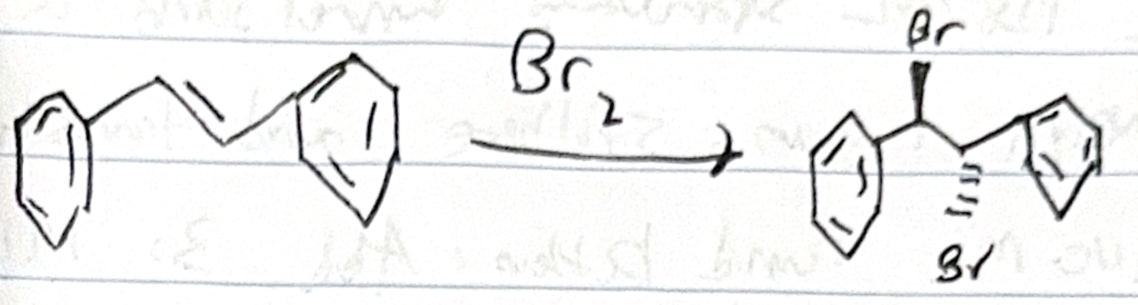
Bromination Lab

Purpose: The purpose of this lab is to perform a bromination reaction on stilbene. We will introduce bromine to a stilbene molecule, resulting in stilbene dibromide.

Reaction Scheme:



Reagent table:

Diethyl ether: MW = 74.12 g/mol BP = 34.6 °C MP = −116 °C

Density = 0.706 g/mL

MSDS = Harmful if swallowed, Irritant, flammable

Trans-stilbene: MW = 180.25 g/mol BP = 305 → 307 °C

MP = 122 → 124 °C Density = 0.97 g/mL

MSDS = Skin, eyes, respiratory, irritant, Toxic if swallowed

Bromine: MW = 159.81 g/mol BP = 58.8 °C

MP = −7.2 °C Density = 3.119 g/mL

MSDS = Skin, eye, respirator Irritant. Toxic

Product table:

1,2-dibromo-2-Phenylethylbenzene: MW = 340.05 g/mol

BP = N/a MP = 235 → 241 °C Density: 1.58 g/mL

MSDS = Toxic, Skin, eye, respiratory, organ irritant

Procedure:

1) Wash a 100 ML round bottom, a clasan adapter, a 125 mL Separatory funnel and a condenser
2) Weigh 1 gram Stilbene and transfer it into 100 ML round bottom. Add 30 ML diethyl ether.
3) Attach claisen adapter to condenser with clip and connect to round bottom
4) Par 7mL of 5% bromine in separatory funnel in the hood
5) Connect Separatory funnel to claisen adapter
6) Transfer bromine to round bottom over 10 mins
7) Stir reaction flask for 15 mins
8) Carry out suction filtration of solid from round bottom
9) Use more diethyl ether to ensure complete transfer of solid. Add 10 mL of diethyl ether to clean bromine off the solid
10) Determine weight and MP of solid

Pre-Lab:

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Pre-Lab:

a) the limiting reagent would be Stilbene.

b) All glassware must be dry to ensure water does not interfere with bromine, which would cause unwanted reactions to take place. This would lead to inaccurate results in the Lab.

c) A Column is not needed for this Lab

Data:

	Grams used	Moles used
1) Trans-Stillbene:	1.00 g	0.0055 mol
Bromine:	1.118 g	0.007 mol

Calculations: $1.00\ g\ \text{stillbene} \times \frac{1\ \text{mole}}{180.25\ g} = 0.0055\ \text{mol Stillbene}$

[illegible] $= 0.007\ \text{mol Bromine}$

$1M \times (7\ mL \div 1000\ mL/L) = 0.007\ \text{mol Br} \rightarrow \times \frac{159.81\ g}{mol} = 1.118\ g\ Br$

2) Products:	Exp MP	Exp grams	Theoretical g	% yield
1,2-dibromo-2-phenyl ethyl) benzene	239.0°C → 242.0°C	1.45 g	1.87 g	77.54 %

Calculations:

$0.0055\ mol \times \frac{340.05\ g\ \text{product}}{1\ mol} = 1.87\ g\ \text{Theoretical Product}$

$\%\ yield = \frac{1.45\ g}{1.87\ g} \times 100\% = 77.54\%\ yield$

3) Describe appearance of product

The product is a white and powdery solid.

4) Addition of bromine in this reaction:

occurs; Syn or (Anti) ?

Reflection:

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Reflection:

In this semester of organic chemistry I Lab, I felt like I learned a lot of valuable lab skills while being able to also use the knowledge I gain from Lecture in a real-life setting. I would say that some of the thing you have done well as a lab instructr is writing a very clear and easy to understand procedure on the board for each lab. I especially found this helpful in harder labs such as the SN_2 lab. I also found that you were very approachable to ask for help. Something that I think could improve the lab experience is more meaningful post-lab and pre-Lab quizzes. I felt like most of the pre-lab questions and post-lab quizzes did not help me understand the lab or the concepts in the lab any better. Overall, its been a great semester and I want to say thank you for being a great lab instructr.